

U.S. Serial No. 10/623,130
Amendment
Response to OA dated March 9, 2005

Atty. Docket No. 740165-353

AMENDMENTS TO THE DRAWINGS

The attached sheet of drawings includes changes to Fig. 5. This sheet replaces the original sheet. In Figure 5, previously omitted element 55 has been added.

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REMARKS

The objection to the drawings under 37 CFR 1.83(a) has been obviated by the concurrent filing of a substitute Figure 5, which plainly illustrates the limitations in the claims directed to "a distance to an obstacle which is positioned ahead of a vehicle." The enclosed new sheet of drawings is labeled "Replacement Sheet" pursuant to 37 CFR 1.21(d). Additionally, the specification has been amended to recite a reference numeral in association with the schematically-depicted "obstacle" in new Figure 5.

The rejection of claims 1-23 under 35 USC 112, second paragraph, has been obviated by deleting the term "strip-shaped" in claim 1, line 1, and further by revising lines 3-4 and line 10 of claim 1 consistent with the suggestions given by the Examiner in the last Office Action. Additionally, the objected-to language in claims 11 and 21 has been either deleted or completely revised so that both of these claims now recite the invention in such clear and concise terms as to allow a person of ordinary skill in the art to readily understand the same. Accordingly, the rejection of claims 1-23 under Section 112, second paragraph, should be reconsidered and withdrawn.

The double-patenting rejection of claims 1-23 over co-pending application Serial No. 10/615,388 and of claims 1-7, 11-17 and 21-23 over U.S. Patent 6,857,594 has been obviated by the concurrent filing of a Terminal Disclaimer limiting the term to any patent that issues from the present application to the term of the '594 patent. Applicants' attorney would point out that the filing of a Terminal Disclaimer directed toward the '594 patent obviates the need for filing a separate Terminal Disclaimer directed to application Serial No. 10/615,388 since the term of the '494 patent will necessarily be shorter than the term of any patent that issues from the '388 application.

The rejection of claims 1-5, 9-15 19-21 and 23 under 35 USC 102(b) and 103 over the Föhl '717 patent has been obviated by amending independent claims 1, 11 and 21 to more clearly distinguish the invention from the prior art of record. However, before the specific language of the amendment is discussed, a brief recap of the principal features and

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advantages of the invention will be made so that the language used in the amendment may be more fully appreciated.

One of the primary purposes of the invention is to provide a drive train between an electric motor and the take-up shaft of a webbing retractor which is capable of instantaneously applying a torque to the take-up shaft by way of connecting members in the form of pawls that reliably engage the teeth of an input gear connected to the take-up shaft. To prevent any possibility of jamming between the pawl tips and the teeth of the input gear, the pawls are spaced uniform angular distances around the input gear, while the number of teeth in the input gear is an odd number. The advantageous operation of this particular mechanical configuration is described in the paragraph bridging pages 34 and 35 of the present specification as follows:

"Here, in the present embodiment, as described above, the total number of the external teeth 122 of the adapter 112 is an odd number. In the state in which the distal end 134A of one of the pawls 130 is abutting the external tooth 122, the distal end 134A of the other pawl 130 is apart from the external tooth 122 along the peripheral direction of the adapter 112, and is positioned at an intermediate portion between the external tooth 122, which is adjacent in the take-up direction along the peripheral direction of the adapter 112, and the external tooth 122 which is adjacent in the pull-out direction. Namely, in the present embodiment, in the state in which the distal ends 134A of the both pawls 130 abut the outer peripheral portion of the adapter 112, the interval from the distal end 134A of one of the pawls 130 to the distal end 134A of the other of the pawls 130 is not an integer multiple of the pitch of the external teeth 122." (Emphasis added.)

Further, as is described in the first paragraph of page 35 of the specification,

"Thus, as shown in Fig. 4, ... even if the distal end 134A of one of the pawls 130 abuts the addendum of the external tooth 122 and cannot mesh with the external tooth 122, the distal end 134A of the other of the pawls 130 reliably meshes with the external tooth 122 if the base plate 92 rotates by substantially one-half of the pitch of the external teeth 122. Thus, the rotation of the base plate 92 can reliably and quickly be transmitted to the adapter 112, and the torque of the motor 44 can be transmitted to the spool 20."

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Claim 1 has been revised to more clearly recite the structural features of the invention which result in the aforementioned advantages in reliable operation. Specifically, claim 1 now recites a webbing retractor for an elongated webbing belt used for application to a body of a vehicle occupant, which comprises a take-up shaft, an input gear connected to the take-up shaft, a prime mover rotating body, and a plurality of connecting members "mounted at uniform angular distances around said input gear" for transmitting rotation of the prime mover rotating body to the input gear

"wherein, in a state in which at least two of said uniformly angularly spaced connecting members contact the input gear, a distance, along a direction of rotation of the input gear, between two meshing portions of the at least two connecting members is substantially different than a number which is an integer multiple of a pitch of a plurality of teeth such that one of said at least two connecting members reliably meshes with said plurality of teeth."

Föhl '717 patent neither discloses nor suggests the webbing retractor recited in amended claim 1. In contrast to the specifically recited "uniformly angularly spaced connecting members" of claim 1, the pawls 32 of the Föhl rotary drive apparatus for a belt tensioner "are slightly offset with respect to each other circumferentially, relative to the tips of the clutch toothing 34." The circumferential offsetting of the pawls 32 around the clutch toothing 34 disadvantageously requires the pawls 32 to be arranged in an angularly asymmetrical pattern around the disk shaped rotor, and for the mounting journals 32b to distribute the torque load asymmetrically with respect to the rotor 14. Applicant submits that such an asymmetrical distribution of load could have long term negative consequences in the overall reliability of the Föhl rotary drive apparatus. Additionally, the necessity of positioning the pawls 32 in angularly asymmetrical positions imposes high tolerances and other design constraints on this device, which in turn increases manufacturing costs over the simpler design of the invention. For all these reasons, the webbing retractor recited in amended claim 1 is patentable over the Föhl '717 patent.

Claim 2 is likewise patentable over the Föhl '717 patent by reason of its dependency upon amended claim 1. Claim 3 is patentable not only by virtue of its dependency to claim 1,

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but further for its recitation at "the input gear has an odd number of teeth," by contrast, the clutch toothing 34 has an even number of teeth, which necessitates the angular offsetting of the clutch pawls 32, with all the attendant disadvantages previously discussed. For all these reasons, claim 3 is clearly patentable over the Föhl '717 patent.

Claims 4 and 5 are patentable at least by reason of their dependency upon amended claim 1. As the Examiner has indicated that claim 6-8 recite patentable subject matter, no further discussion of these claims is deemed necessary.

Claims 9 and 10 are likewise patentable at least by reason of their dependency of amended claim 1.

Claim 11 has been amended to substantially recite not only the limitations discussed with respect to amended claim 1, but also claim 3 (*i.e.*, "wherein said input gear has an odd number of teeth..."). Accordingly, claim 11 is patentable for all the reasons given with respect to claim 3.

Claims 12, 13, 14 and 15 are each patentable at least by reason of their dependency upon amended claim 11.

Claims 16-18 have previously been indicated as reciting patentable subject matter, no discussion of these claims was deemed necessary.

Claims 19 and 20 are likewise patentable at least by reason of their dependency upon amended claim 1.

As claim 21 has been amended to include all the limitations recited in amended claim 1, all of the arguments for patentability submitted with respect to claim 1 apply with even greater force to claim 21 as claim 21 includes a substantial number of additional mechanical limitations.

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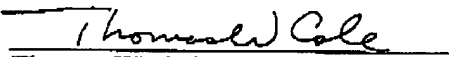
As claim 22 was not rejected over the prior art in the last Office Action, Applicants assume that the Examiner deems this claim to be patentable, accordingly, no further discussion of claim 22 is necessary.

Finally, claim 23 is patentable at least by reason of its dependency upon amended claim 21.

Now that the claims are believed to be patentable, the prompt issuance of a Notice of Allowance and Issue Fee Due is hereby earnestly solicited.

The Commissioner is authorized to charge any overage or shortage of fees connected with filing of this Amendment to Deposit Account No. 19-2380 (740165-353).

Respectfully submitted,


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